

## ABSTRACT

A portable apparatus for measuring characteristics of hydraulic features in rivers and streams that are unwadeable. The apparatus consists of a tripod base, a horizontal boom that articulates on the tripod, a carriage configured to travel on the boom, and a measuring rod that can be moved vertically on the carriage. These components are designed to be portable, carried by hand or in a raft, and are adapted to be assembled on rugged terrain. The measuring rod is configured to accommodate sensors to measure characteristics such as channel topography, water surface topography, air-water mixing, velocity pressure differentials, and lift and drag forces. The apparatus can be adapted for measurement and monitoring in harsh environments such as volcanic lakes, fumaroles, and hot springs. The invention can be utilized for sampling air quality, weather, water quality, fluid mechanics (gas or liquid), soils, sediments, volcanic gases and hydrothermal fluids.